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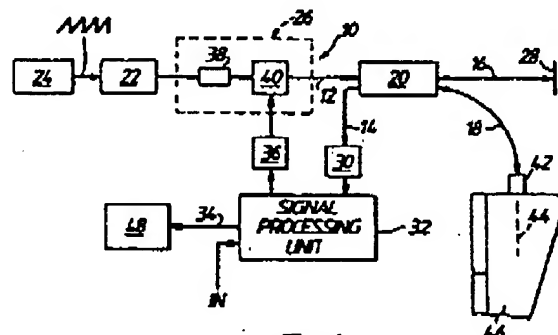
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Ickenham Uxbridge UB10 8BZ(GB)**54 **Polarimetric optical frequency domain distributed strain sensor and method.**

57 An optical frequency domain distributed strain sensor for determining the strain distribution along an optical fibre (44) includes an optical source (32) which provides a polarization controlled optical interrogation signal having a frequency varying in a recurring linear manner. The interrogation signal is injected into the fibre embedded within a composite structure (46) which places the fibre under strain. A portion of the interrogation signal is backscattered from the sensing fibre (44) as a consequence of the strain experienced by the fibre and is mixed with a reference signal to produce beat frequency signals. The frequency of the beat signals is directly related to the position of backscatter in the sensing fibre while the amplitude of each beat frequency signal is directly related to the integrated strain-induced birefringence up to the backscatter point. An in-line fibre polarizer (38,40) control the polarization state of the interrogation signal in the sensor fibre (44) to provide zero point sensitivity compensation and controllable testing for ambiguous strain points.

**FIG.1.****EP 0 320 255 A3**

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